

What is claimed is:

1. An apparatus for packetizing a coded bitstream of digital data in accordance with a transport protocol comprising:

time information generating means of generating the time information in accordance with a specification of said transport protocol;

header generating means of generating a header with including said time information generated by said time information generating means; and

packet generating means of generating a packet with adding said header generated by said header generating means into every predetermined unit of said bitstream.

2. The apparatus as claimed in claim 1, wherein said coded bitstream of digital data is MPEG4 stream, and

wherein said packet generated by said packet generating means is MPEG2-PES packet.

3. The apparatus as claimed in claim 1, further comprising:

header detecting means of detecting a header from the coded bitstream of digital data; and

header analyzing means of analyzing said header detected by said header detecting means to obtain predetermined information therefrom, wherein said time information generating means generates said time information in accordance with the specification of said transport protocol using said predetermined information obtained by said

header analyzing means.

4. The apparatus as claimed in claim 1, further comprising bit rate calculating means of calculating a bit rate of the coded bitstream of digital data, wherein said time information generating means generates said time information in accordance with said specification of said transport protocol using said bit rate calculated by said bit rate calculating mean.

5. The apparatus as claimed in claim 1, wherein said time information generating means generates said time information in accordance with the specification of said transport protocol using the time information contained in a predetermined bitstream other than said coded bitstream of digital data.

6. The apparatus as claimed in claim 5, wherein said coded bitstream of digital data is MPEG4 stream, and

wherein said packet generated by said packet generating means is MPEG2-PES packet.

7. The apparatus as claimed in claim 1, further comprising an encoder for generating said coded bitstream of digital data, wherein said time information generating means generates said time information in accordance with said specification of said transport protocol using information from said encoder.

8. The apparatus as claimed in claim 7, further comprising a decoder for decoding said coded bitstream of digital data, wherein said information from said encoder is information concerning said decoder.

9. The apparatus as claimed in claim 7, wherein said information from said encoder is information concerning said coded bitstream of digital data.

10. The apparatus as claimed in claim 1, wherein the time information generating means generates said time information in accordance with said specification of said transport protocol using maximum bit rate of said coded bitstream of digital data.

11. The apparatus as claimed in claim 1, further comprising:

a stream analyzer of analyzing said coded bitstream of digital data;

a decoder of decoding at least said coded bitstream of digital data; and

an arithmetic means of performing arithmetic operation on time until said decoder starts decoding said bitstream on the basis of a result of the analysis of said stream analyzer, wherein said time information generating means generates said time information in accordance with said specification of said transport protocol using an arithmetic result of said arithmetic means.

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12. An apparatus for packetizing a plurality of coded bitstreams for digital data in accordance with respective transport protocols comprising:

a plurality of time information generating means each for generating time information in accordance with a specification of each of said transport protocols;

a plurality of header generating means each for generating a header with including a plurality of pieces of time information generated by said plurality of time information generating means; and

a plurality of packet generating means each for generating a packet with adding the header generated by said plurality of header generating means into every predetermined unit of said plurality of bitstreams, wherein said plurality of time information generating means generates time information in accordance with a specification of each of the transport protocols using common time information.

13. The apparatus as claimed in claim 12, wherein said coded bitstream of digital data is MPEG4 stream, and

wherein said packet generated by said packet generating means is MPEG2-PES packet.

14. A method of packetizing a coded bitstream of digital data in accordance with a transport protocol comprising:

a first step of generating said time information in accordance

with a specification of said transport protocol;

a second step of generating a header with including said time information generated during the first step; and

a third step of generating a packet with adding said header generated during the second step into every predetermined unit of said bitstream.

15. The method as claim 14, wherein said coded bitstream of digital data is MPEG4 stream, and

wherein said packet generated by said third step is MPEG2-PES packet.

16. The method as claimed in claim 14, further comprising:

a forth step of detecting a header from said coded bitstream of digital data; and

a fifth step of analyzing said header detected during said forth step to obtain predetermined information therefrom, wherein in said first step, said time information in accordance with the specification of said transport protocol is generated using said predetermined information obtained during said fifth step.

17. The method as claimed in claim 14, further comprising forth step of calculating a bit rate of said coded bitstream of digital data, wherein in said first step, said time information in accordance with said specification of said transport protocol is generated using said bit rate

calculated during said forth step.

18. The method as claimed in claim 14, wherein in said first step, said time information in accordance with said specification of said transport protocol is generated using time information contained in a predetermined bitstream other than said coded bitstream of digital data.

19. The method as claimed in claim 18, wherein said coded bitstream of digital data is MPEG4 stream, and

wherein said predetermined bitstream is MPEG2-PES packet stream.

20. The method as claimed in claim 14, wherein in said first step, said time information in accordance with said specification of said transport protocol is generated using information from an encoder for generating said coded bitstream of digital data.

21. The method as claimed in claim 20, wherein said information from said encoder is information concerning a decoder for decoding said coded bitstream of digital data.

22. The method as claimed in claim 20, wherein said information from said encoder is information concerning said coded bitstream of digital data.

23. The method as claimed in claim 14, wherein in said first step, said time information in accordance with said specification of said transport protocol is generated using maximum bit rate of said coded bitstream of digital data.

24. The method as claimed in claim 14, further comprising:

a forth step of analyzing said coded bitstream of digital data;

and

a fifth step of performing arithmetic operation on time until said decoder for decoding at least said coded bitstream of digital data starts decoding said bitstream on the basis of a result of said forth step, wherein in said first step, said time information in accordance with said specification of said transport protocol is generated using an arithmetic result of said fifth step.

25. A method of packetizing a plurality of coded bitstreams of digital data in accordance with respective transport protocols comprising:

a first step of generating a plurality of pieces of time information in accordance with a specification of each of said transport protocols;

a second step of generating a plurality of headers with including a plurality of pieces of time information generated during said first step; and

a third step of generating a plurality of packets with adding the headers generated during said second step into every predetermined unit

of said plurality of bitstreams, wherein in said first step, said plurality of pieces of said time information in accordance with a specification of each of the transport protocols is generated using common time information.

26. The method as claimed in claim 25, wherein said coded bitstream of digital data is MPEG4 stream, and

wherein said packet generated during said third step is MPEG2-PES packet.

27. An apparatus for packetizing a coded bitstream of digital data in accordance with a transport protocol comprising:

storing means of storing said coded bitstream every predetermined unit of said coded bitstream;

time information generating means of generating time information every said predetermined unit, said time information being necessary for a synchronous transport in accordance with said transport protocol; and

packet generating means of generating a packet with adding said time information generated by said time information generating means into every said predetermined unit stored in said storing means.

28. An apparatus for packetizing an MPEG4 stream in accordance with a specification of an MPEG2-PES stream protocol comprising:

storing means of storing said MPEG4 stream every



predetermined unit of said MPEG4 stream;

time information generating means of generating time information every said predetermined unit of said MPEG4 stream, said time information being required to transport the bitstream in accordance with an MPEG2-PES stream protocol; and

packet generating means of generating a packet with adding said time information generated by said time information generating means into every said predetermined unit of said MPEG4 stream stored in said storing means.

29. The apparatus as claimed in claim 27, wherein said time information generating means generates said time information using time information embedded in a separate packet stream from said packet stream synchronously transported in accordance with said transport protocol.

30. The apparatus as claimed in claim 28, wherein said time information generating means generates said time information using time information embedded in a separate MPEG2-PES stream.

31. An apparatus for packetizing an MPEG4 stream in accordance with a specification of an MPEG2-PES stream protocol comprising:

storing means of storing said MPEG4 stream every predetermined unit of said MPEG4 stream;

detecting means of detecting information from said MPEG4 stream, said information being required to generate said time

information required when said MPEG2-PES stream is transported;

time information generating means of generating said time information every said predetermined unit of said MPEG4 stream on the basis of said information detected by said detecting means; and

packet generating means of generating a packet with adding said time information generated by said time information generating means into every said predetermined unit of said MPEG4 stream stored in said storing means.

32. The apparatus as claimed in claim 31, wherein said detecting means detects a bit rate of said MPEG4 stream, occupancy of the data to be stored in a buffer until a start of decoding said MPEG2-PES stream, and frame rate on said MPEG4 stream, from said MPEG4 stream.

33. The apparatus as claimed in claim 32, wherein said detecting means further detects information indicating one of I-picture, P-picture and B-picture, information indicating how many seconds it takes from said I-picture, and information indicating an order of reproduction, from said MPEG4 stream.